

The Office Action rejected Claims 45-53 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,032,313 (Tokuhara) in view of an article in *Inorganic Materials*, 1992, vol. 28, no. 3 (Cheredov) and U.S. Patent No. 4,818,282 (Wanetzky et al.). Applicant submits that amended independent Claim 45 is patentably distinct from the cited prior art for at least the following reasons.

The aspect of the present invention set forth in Claim 45 is directed to a production apparatus for producing a fluoride crystal. The apparatus includes a crucible divided into a plurality of stages, with a lower portion of a first stage positioned to cover an upper edge of a wall portion of a second stage. The apparatus also includes a heater arranged to heat the crucible. A degassing hole is formed in a side wall portion of the crucible for discharging an impurity gas produced when a scavenger is added to refine a material. The overall height of the plurality of stages is 10mm to 50mm, the degassing hole has a diameter of 1mm to 5 mm. By virtue of the recited structure, the advantages discussed at page 16, lines 1-20 can be achieved, in particular, the production apparatus is able to produce crystals of higher purity than crystals made by conventional means.

Tokuhara relates to an apparatus for producing optical fibers. Tokuhara teaches the use of a crucible 1 with an overflow passage 7 in a side wall thereof through which molten (liquid) material flows. (See column 2, lines 36-41.) Cheredov, as understood by Applicant, discloses a multiple-container crucible with concentric bottom holes. Wanetzky et al., as understood by Applicant, relates to a method for recovering metal-carbide scrap. Apparently, Wanetzky et al. teaches the use of stacked crucibles, each formed with an annular channel. A

vapor conduit 21 located at the bottom of a lowermost crucible apparently is used as an inlet to provide an inert gas to push metal vapors to a condensing unit. (See column 5, lines 25-45.)

Applicant submits that a combination of Tokuhara, Cheredov, and Wanetzky et al., assuming such combination would even be permissible, would fail to teach or suggest a crystal production apparatus that includes a crucible that has "formed therein a degassing hole in a side wall portion thereof for discharging an impurity gas produced when refining a material by adding a scavenger thereto," as well as the other features now recited in Claim 45.

The structure in Tokuhara alleged to correspond to the recited degassing holes, actually are provided for an overflowing bubble in molten glass. To modify Tokuhara in the manner proposed, so as to use the overflow passages 7 and 8 as degassing holes, changes the principle of operation of the reference, which is improper in combining references under Section 103. See MPEP 2143.01.

Moreover, as was mentioned in the previous response, the cited references apparently do not address the problem of how to remove gaseous impurities and, thus, would not suggest to one of ordinary skill in the relevant art to include such a feature in a crucible for a crystal production apparatus. Accordingly, Applicant submits that Claim 45 is patentable over the cited art.

A review of the other art of record has failed to reveal anything that, in Applicant's opinion, would remedy the deficiencies of the art discussed above, as applied against the independent claims herein. Therefore, those claims are respectfully submitted to be patentable over the art of record.

The other claims in this application depend from Claim 45 and, therefore, are submitted to be patentable for at least the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, individual consideration of the patentability of each claim on its own merits is respectfully requested.

This Amendment After Final Rejection is believed clearly to place this application in condition for allowance and its entry is therefore believed proper under 37 C.F.R. § 1.116. Accordingly, entry of this Amendment After Final Rejection, as an earnest effort to advance prosecution and reduce the number of issues, is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

Applicant's undersigned attorney may be reached in our New York Office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,



Attorney for Applicant

Registration No. 38,586

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200

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VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

45. (Amended) A production apparatus for producing a crystal, said apparatus comprising:

a crucible divided into a plurality of stages; and

a heater arranged to heat said crucible,

wherein said crucible has formed therein a degassing hole in a side wall portion thereof for discharging an impurity gas produced when refining a material by adding a scavenger thereto, and

wherein a lower portion of a first stage of the plurality of stages is positioned to cover an upper edge of a wall portion of a second stage of the plurality of stages, the overall height of said plurality of stages is 10mm to 50mm, the degassing hole has a diameter of 1mm to 5 mm, and the crystal is fluoride crystal.

Claim 48 is cancelled.

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